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SAYS SOVIETS LEAD IN ANTIBIOTICS FIELD

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No one need express any surprise at the fact that the Soviets are the leading nation in the world in the field of antibiotics. Soviet scientists have an invaluable background in work done by such famous scientists as Gertsen, Dobrolyubov, Chernyshev, and others. Timiryazev was the originator of the materialistic theory of Darwinism. Mechnikov did much to further materialistic thinking in Darwinism. Vinogradov studied the association of microbes by using methods involving electric media. The results of work by Tsenkovskiy, Lesh, Gabrichevskiy, Gamaleya, Vinogradskiy, Sorokin, and Ivanovskiy did much to increase Soviet knowledge of many microbe-induced diseases. Particular value is attached to work done to differentiate between the biology of microbes in humans and in nature. Microbes in nature exist in a very complex state of interrelationship. There are, for example, the phenomena of symbiosis, metabiosis, and antagonism or antibiosis.

So far, Soviet science has been unable to develop a classification system for microorganisms which would illustrate the course of evolutionary development of microbes. Moreover, there is no definite distinction between different types of bacteria. As a result of some of the research which has gone into the explanation of the above phenomena, a new field of endeavor has been created--study of the interrelationship of living microbes. Pavlovskiy in 1887 determined that B. prodigiosus and B. Friedlander inhibit the development of anthrax bacillus. In 1890, Blagoveshchenskiy in experiments on animals illustrated the antibiotic action of blue-pus bacillus on the causative agents of anthrax. Gamaleya showed the antagonistic relationship between Mechnikov's vibroines and cholera vibroines. Gabrichevskiy and Malyutin showed that the cholera vibrio exhibited bacteriostatic action against intestinal, blue-pus, typhus, and anthrax bacilli.

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Soviet scientists were primarily interested in those chemical agents which were responsible for either the "friendly" or "antagonistic" relationships between microorganisms. Sirotinin suggested that antagonism was the result of changing the nutrient media into either acid or alkali, thus making it unsuitable for some microbes. He notes however that there may exist other factors which influence antagonism. Mechnikov on the other hand suggested that the phenomena of "antagonism" revolved around the theory of "survival of the fittest" in the microbe world. He was the first to state that the lactobacillus could be utilized for combatting intestinal bacillus. In 1892, Chistovich published papers in which he described the therapeutic action of beer mash on erysipelas cases.

A very important milestone in Soviet science was passed with the discovery of specific secretions of some fungus which has a definite reaction in aiding in the identification of some microbes which are causative agents of diseases. In 1871, Manassein proved that certain green fungi would inhibit the growth of bacterial flora. Polotebnov continued this research and proved that an emulsion of spores in almond oil would effectively dry up many forms of skin ecthyma. He further suggested that there is no complication on the surface or within hemophilic ulcers which are subjected to administration of an ointment containing penicillin and bacteria. On the contrary, very often there is a definite improvement in the ulcerous condition. This fact is proof that Russian scientists knew of the existence and effect of penicillin more than 70 year ago.

It was only under the fraternalism of the Soviet that science was able to accomplish such great strides. Under the able supervision of Gamaleya, there was great impetus in the study of the action of pyocyanase on anthrax bacillus. In 1924, at the 8th All-Russian Conference of Bacteriologists, Microbiologists, and Sanitation Specialists Gamaleya revealed the existence of pyocl.st, which he isolated from the bacteriolysin of anthrax. Work on pyocyanin was continued at the Ukrainian Institute imeni Mechnikov, where Professor Derkach was able to obtain a pure crystalline substance which has received wide use in practice.

Gauze and Brazhnikova were responsible for isolating the antibiotic gramicidin C from B. brevis. For a long time scientists have known of the antagonistic relationship of some bacilli to microbes. Many Soviet scientists, Professors Kurochkin and Artem'yev among others, are continuing studies to determine bacillus which will aid in the therapy of suppurative trauma and other diseases.

From the production as well as qualitative standpoint, actinomycetes head the list. From 30 to 40 percent of the actinomycetes found in soils have antagonistic and antibacterial action. Some types of soil actinomycetes contain up to 70 percent antagonistic organisms.

During World War II, scientists like Yermol'yeva, Levitov, Balezina, Severin, Shemyakina, and others established the Soviet industry for penicillin production.

Soviet science owes much to past heritage. In 1928, Filatov and others suggested that plants might contain substances which have bactericidal and fungicidal action. Filatov and his contemporaries identified the chemical composition and activity of many phytoncides. Today Tokin, among others, is very actively attempting to determine new plant extracts of medicinal value. Others, such as Zil'ber, Yakobson, and Yermol'yeva, suggested that living animals have a certain amount of natural immunity and thus have attempted to isolate bactericidal substances from the organs and tissues of animals.

Many of the foreign scientists consider that penicillin is the accidental product of metabolism and attach no significance to the process of evolution. This coantiscientific attitude is greatly hindering their efforts to determine the existence of new antibiotics. Soviet scientists, on the other hand, consider the production of antibiotics as an integral part of the development of a microorganism. They consider that the antagonistic action of the products of the microorganism's existence plays a most significant role in survival as a result of the interspecies conflict. Determination of these products will eventually lead to methods for identifying specific types of microorganisms. In this respect the world is anxiously awaiting the results of studies now being carried out by Chastukhin and Nikolayevska on the ecology of fungi which produce antibiotics. It is believed that a thorough study of the ecology of fungi will permit the determination of new antibacterial substances from known microorganisms and which will have favorable action against many diseases.

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